WHAT IS CLAIMED IS:

1. An apparatus for randomly assigning downlink sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, said apparatus assigns user data of a plurality of user equipments (UEs) to the time slots in each sub-frame, the apparatus comprising:

a multiplexer for creating a user data part by multiplexing user data for a UE, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of a downlink channel; and

a controller for randomly assigning time slots for transmitting the user data part in the sub-frames, based on a time slot number initially assigned for the user data part, a sub-frame number at a transmission point of the user data part, and the number of assigned uplink time slots in the corresponding sub-frame.

2. The apparatus as claimed in claim 1, wherein the controller assigns, as a time slot number for transmitting the user data part, a fourth value determined by adding the number of downlink time slots in the sub-frame to a third value obtained by performing a modulo operation with the number of the uplink time slots on a second value determined by adding the initially assigned time slot number to a first value generated from a function having an input value determined by exclusive ORing (XOR) a binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

3. The apparatus as claimed in claim 2, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-

frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

4. The apparatus as claimed in claim 2, wherein the function is represented by,

$$M[A]=\sum_{n=0}^{12} a_n \times 2^n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

5. The apparatus as claimed in claim 2, wherein the function is represented by,

$$M[A]=\sum_{n=0}^{12} a_n \times (n+1)$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

6. An apparatus for randomly assigning uplink sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, said apparatus assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the apparatus comprising:

a multiplexer for creating a user data part by multiplexing user data to be transmitted to a Node B, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of an uplink channel; and

a controller for randomly assigning time slots for transmitting the user data part in the sub-frames, based on a time slot number initially assigned for the user data part, a

sub-frame number at a transmission point of the user data part, and the number of assigned uplink time slots in the corresponding sub-frame.

7. The apparatus as claimed in claim 6, wherein the controller assigns, as a time slot number for transmitting the user data part, a fourth value determined by adding the number of downlink time slots in the sub-frame to a third value obtained by performing a modulo operation with the number of the uplink time slots on a second value determined by adding the initially assigned time slot number to a first value generated from a function having an input value determined by exclusive ORing (XORing) a binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

8. The apparatus as claimed in claim 7, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

9. The apparatus as claimed in claim 7, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n \times 2^n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

10. The apparatus as claimed in claim 7, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n \times (n+1)$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

11. An apparatus for receiving a downlink signal of randomly assigned sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the apparatus comprising:

a controller for determining reception sub-frame time slots in association with the randomly assigned sub-frame time slots, based on a time slot number initially assigned at a reception point of the downlink signal and a sub-frame number at the reception point; and

a demultiplexer for demultiplexing the downlink signal received at the reception sub-frame time slots, and outputting user data, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of a downlink channel.

12. An apparatus for receiving uplink signals of randomly assigned sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the apparatus comprising:

a controller for determining reception sub-frame time slots in association with the randomly assigned sub-frame time slots, based on a time slot number initially assigned at a reception point of the uplink signals and a sub-frame number at the

reception point; and

a demultiplexer for demultiplexing the uplink signals received at the reception sub-frame time slots, and outputting user data, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of an uplink channel.

13. A method for randomly assigning downlink sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the method comprising the steps of:

creating a user data part by multiplexing user data for a UE, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of a downlink channel; and

randomly assigning time slots for transmitting the user data part in the sub-frames, based on a time slot number initially assigned for the user data part, a sub-frame number at a transmission point of the user data part, and the number of assigned uplink time slots in the corresponding sub-frame.

14. The method as claimed in claim 13, wherein the step of randomly assigning the time slots comprises the step of assigning, as a time slot number for transmitting the user data part, a fourth value determined by adding the number of downlink time slots in the sub-frame to a third value obtained by performing a modulo operation with the number of the uplink time slots on a second value determined by adding the initially assigned time slot number to a first value generated from a function having an input value determined by exclusive ORing (XORing) a binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

15. The method as claimed in claim 14, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

16. The method as claimed in claim 14, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n \times 2^n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

17. The method as claimed in claim 14, wherein the function is represented by,

$$M[A] = \sum_{n=0}^{12} a_n \times (n+1)$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

18. A method for randomly assigning uplink sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the method comprising the steps of:

creating a user data part by multiplexing user data to be transmitted to a Node B, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of an uplink channel; and

randomly assigning time slots for transmitting the user data part in the sub-frames, based on a time slot number initially assigned for the user data part, a sub-frame number at a transmission point of the user data part, and the number of assigned uplink time slots in the corresponding sub-frame.

19. The method as claimed in claim 18, wherein the step of randomly assigning the time slots comprises the step of assigning, as a time slot number for transmitting the user data part, a fourth value determined by adding the number of downlink time slots in the sub-frame to a third value obtained by performing a modulo operation with the number of the uplink time slots on a second value determined by adding the initially assigned time slot number to a first value generated from a function having an input value determined by exclusive ORing (XORing) a binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

20. The method as claimed in claim 19, wherein the function is represented by,

$$M[A]=\sum_{n=0}^{12} a_n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

21. The method as claimed in claim 19, wherein the function is represented by,

$$M[A]=\sum_{n=0}^{12} a_n \times 2^n$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

22. The method as claimed in claim 19, wherein the function is represented by,

$$M[A]=\sum_{n=0}^{12} a_n \times (n+1)$$

where A is a value obtained by XORing the binary sequence corresponding to the sub-frame number and an arbitrary binary sequence among binary sequences having the same length as the binary sequence corresponding to the sub-frame number.

23. A method for receiving a downlink signal of randomly assigned sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the method comprising the steps of:

determining reception sub-frame time slots in association with the randomly assigned sub-frame time slots, based on a time slot number initially assigned at a reception point of the downlink signal and a sub-frame number at the reception point; and

demultiplexing the downlink signal received at the reception sub-frame time slots, and outputting user data, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control) symbol for controlling transmission power of a downlink channel.

24. A method for receiving uplink signals of randomly assigned sub-frame time slots transmitting user data in an TDD (Time Division Multiplexing) communication system which includes a plurality of frames having different frame numbers, each of the frames including a plurality of sub-frames having different sub-

frame numbers, each of the sub-frames including a plurality of time slots, and assigns user data of a plurality of UEs (User Equipments) to the time slots in each sub-frame, the method comprising the steps of:

determining reception sub-frame time slots in association with the randomly assigned sub-frame time slots, based on a time slot number initially assigned at a reception point of the uplink signals and a sub-frame number at the reception point; and

demultiplexing the uplink signals received at the reception sub-frame time slots, and outputting user data, a TFCI (Transport Format Combination Indicator) symbol for the user data, and a TPC (Transmission Power Control command) symbol for controlling transmission power of an uplink channel.